MULTIMEDIA UNIVERSITY

STUDENT ID NO

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# MULTIMEDIA UNIVERSITY

# FINAL EXAMINATION

**TRIMESTER 3, 2015/2016**

## TCS 3191 – CLIENT-SERVER COMPUTING

( All sections / Groups )

2nd JUNE 2016
2.30 pm – 4.30 pm
( 2 Hours )

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**INSTRUCTIONS TO STUDENTS**

1. This question paper consists of 6 pages including cover page with 5 questions only.
2. Attempt **FOUR** out of FIVE questions. All questions carry equal marks and the distribution of the marks for each question is given.
3. Please write all your answers in the Answer Booklet provided.

***Instruction: Answer only FOUR questions.***

**QUESTION 1 (10 marks)**

a) Briefly describe **THREE** main components of client-server computing. What is the main function of middleware?

(2.5 marks)

b) Borhan is a decision maker for Pepe's Atlantic Sausage Company. He needs to decide which servers to buy for his company's expansion plan. Because there are several categories of servers, suggest to Borhan the category of servers that can do the following tasks:

i. Provide gateway to other Local Area Networks (LANs), networks and computers.
ii. Manage a work group's application and data files, so that they may be shared by the group.
iii. Store and manage data only.
iv. Perform application logic processing.

(2 marks)

c) Alice in the IT department at the Cho Manufacturing Company plant is planning for her company to have a Web system that would allow employees to use a secure logon to view their paychecks information. Alice wants the system to interface with health and dental insurance companies to obtain the amount remaining in the employee's account for the year. Alice proposes two-tier architecture. However, many Web systems are three-tier.

Discuss with Alice the **FOUR** benefits of three-tier architecture over two-tier architecture.

(2 marks)

d) You wanted to make a Remote Procedure Call (RPC) to a server. You received the following number of responses from the server:

i. 0 time
ii. 1 time
iii. More than 1 time

Discuss the possible reason why you received different responses from RPC on the server.

(1.5 marks)

**Continued...**

e) Briefly discuss the **FOUR** best situations for Remote Data Access (RDA) deployment.

(2 marks)

**QUESTION 2 (10 marks)**

a) Briefly discuss **TWO** advantages and **TWO** disadvantages of Message-Oriented Middleware (MOM).

(2 marks)

b) How does Composite Event Detention (CED) work?

(1 mark)

c) Name the first popular commercial Network Operating System (NOS). Briefly explain the functions of **TWO** major innovations presented in that NOS.

(2.5 marks)

d) Williwonk's Chocolates of Kampung Sungai Rambai makes an assortment of chocolate candy and candy novelties. The company has six in-city stores, five stores in major metropolitan airports, and a small mail-order branch. Williwonk's has a small, computerized information system that tracks inventory in its plant, helps schedule production, and so on, but this system is not tied into any of its retail outlets.

Williwonk's decides to implement a distributed database system connecting its entire retail outlets. You, as Database Manager in Williwonk's, need to propose how data resources should be distributed across all databases in the system. Using **FIVE** components of data allocation metric, prepare a table of comparison for each of the following data allocation strategies (comparison values: Low, Average, High, Poor, Satisfactory):

| | **Fragmented** | **Complete Replication** |
|---|---|---|
| **Locality of Reference** | | |
| **Reliability/ Availability** | | |
| **Storage Costs** | | |
| **Performance** | | |
| **Communication Costs** | | |

(2.5 marks)

c) Briefly discuss **FOUR** reasons why there is a need for SQL Middleware.

(2 marks)

**Continued...**

**QUESTION 3 (10 marks)**

a) What are the TWO functions of SQL/PSM?

(1 mark)

b) Compare the differences between Embedded SQL (ESQL) and SQL Call-Level Interface (SQL CLI) by filling in the table below.

| Feature | SQL CLI (Yes/No)? | ESQL (Yes/No)? |
|---|---|---|
| Requires target database to be known ahead of time | | |
| Supports dynamic SQL | | |
| Compile-time type checking | | |
| Applications must be pre-compiled and bound to database server | | |
| Easy to debug | | |

(2.5 marks)

c) Two-phase commit (2-PC) is the standard protocol for making commit and abort of a transaction atomic. Briefly explain the steps Phase 1 and Phase 2 of 2-PC protocol.

(3 marks)

d) In a three-tiered model of transaction processing system (TPS), where should you locate the transaction server? What should be stored on the server? What kind of processing the server should do?

(1.5 marks)

e) Given a hypothetical TPS that consists of 100 clients, 13 application servers, and 6 transaction/database servers. Calculate the number of sessions if the system uses the following models:

i. Two-tier model.
ii. Three-tier model.

Draw the configuration of the sessions for each model.

(2 marks)

**QUESTION 4 (10 marks)**

a) Discuss the different between queued and direct transaction processing.

(2 marks)

**Continued...**

b) Your friend is deciding which infrastructure is suitable for building and administering complex transaction processing systems with a large number of clients and multiple servers. She is being confronted with four different design requirements. Suggest to her the right transaction model to use for each of the following requirements:

i. Instead of individual login session per terminal, server process communicates with the terminal, handles authentication, and executes actions.
ii. Multiple application server processes access a common database; clients communicate with the application through a single communication process that routes requests.
iii. Multiple processes communicate with clients.
iv. All remote terminals connect to a single server process.

(2 marks)

c) Briefly list the object types for the each of the following criteria:

i. Types of Objects I
ii. Types of Objects II

(2 marks)

d) Briefly describe the **THREE** broad categories of objects in Common Object Request Broker Architecture (CORBA).

(1.5 marks)

e) Briefly list **THREE** similarities and **TWO** differences between CORBA and DCOM.

(2.5 marks)

**QUESTION 5 (10 marks)**

a) There are several limitations of wireless network in mobile environment. One of the limitations is due to frequent disconnections. Briefly discuss **SIX** reasons why mobile connections are frequently disconnected?

(3 marks)

b) Mobile Internet Protocol (IP) aims to provide for seamless relocation by providing services to mobile users as if they were at their home network.

List **THREE** features of Mobile IP. What are the **TWO** impacts of Mobile IP on users?

(2.5 marks)

**Continued...**

c) Define the distributed multimedia systems (DMS).

(2 marks)

d) Briefly explain the **FIVE** current trends in DMS.

(2.5 marks)

**End of Page.**